



## ISO 9001 QUALITY MANAGEMENT SYSTEM AUDIT AS AN ORGANIZATIONAL EFFECTIVENESS EVALUATION TOOL

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### ABSTRACT

*ISO 9000 family of quality management system standards are meant to enable organizations to set up effective management systems with which they can meet the needs of interested parties and assure sustained success. The evaluation tool preferred by many organizations for feedback on system effectiveness has been third party audit with success and certification taken as an indicator of management system effectiveness. The purpose of the empirical study reported in this paper was to investigate the relationship between a successful pre-ISO 9001 certification audit and effectiveness of an organization. The study uses the data from multiple informants in each participating organization to identify two configuration groupings, the ISO hard elements and the systemic oriented groups and finds that effectiveness of a certified organization may be predicted from the group into which it is classified. The conclusion is that certification status by itself is not an indicator of effectiveness. The study adds to the literature on the relationship between ISO 9001 certification and performance. A key implication of the findings for the managers is the need to see the quality management system standard in terms of a management technology rather than a marketing tool with certification as the visible icon.*

**Keywords – Quality management, ISO 9001, Customer satisfaction, system audit**

### INTRODUCTION

Continued existence of an organization is made that much more assured if it is able to achieve satisfaction for its own employees, the society, its customers and of the business goals of its owners [20]. Employees want to work in safe environment free from risks of hazards and accidents, the society seeks to collectively enjoy the benefits from the organization's existence but not at the expense of the environment they share. The customers will definitely want value for money but continuous satisfaction of this need is only possible if those who have invested their assets for the organization to exist, either through budgetary allocation, stock holding or some other form can be assured of the money value maintenance.

Capability of an organization to achieve the satisfaction of each category of interested parties can then be assessed by evaluating the management system. ISO 9000 family of quality management system standards are meant to help organizations achieve the above aims by providing frameworks for

The focus for actions of managers is the balance of these needs. The development of the "organization as a system" theory has made it possible to document and analyze how this focus is achieved. Application of an "organization as system" thinking to managing organizations entails describing the organization in terms of management systems. A "management system" constitutes the collection of structures, procedures and systems that manage organization's sub parts, its inputs, outputs and the feedback. It is argued that by applying this thinking, the required constant adaptation through cycles of exchange of materials to and from the organization's environment is made possible [6].

evaluation of and guideline for establishment of effective management systems [14]. The word "effectiveness" is often used interchangeably with the word "efficiency". Yet these words refer to different aspects of operational activity. It is possible to have a situation in which the work system can best be described as "ineffectively efficient".



The ineffectiveness would be coming from the things done within the work system, if these things are not the “right things” the work unit should be doing. Unnecessary inspections, repeated work actions, work actions that would make no difference to the work output if they had been left undone are some of the wrong things done in organizations. Effectiveness of a management system would therefore be a measure of the extent the prescribed activities constitute right things. As emphasized by Poulida and Constantinou [20], effectiveness must be in terms of the extent the activities prescribed and carried out in an organization can lead to sustained achievement of satisfaction of its employees, its customers, the society, and of the business goals of its owners. The publication of ISO 9000 Quality Management system standards as a complementary pair of standards provides a range of opportunities for organizations to achieve broad or focused aims.

Where the management has chosen to adopt the quality management approach to management, ISO 9004:2009, titled, “Managing for the sustained success of an organization — A quality management approach” provides the guideline for establishment of effective management of an organization. Effectiveness in this approach is evaluated in terms of achievement of the needs and expectations of not just the customers but also of the other interested parties – the business goals, effect on society and needs of employees. This contrasts with the context in which the top management of the organization does not wish to pursue more systematic and continual improvement in overall performance but have adopted a narrower focus to requirements of the customer, statutory and regulatory authorities as relevant to a specific product.

Where the focus is to customer, statutory and regulatory requirements only, ISO 9001:2008 standard, titled, “Quality Management Systems – Requirements”, is designed for use internally for customer-supplier contract purposes or externally by way of third party certification. As a contractual tool, the evaluation is against specific audit criteria which emphasize some aspects of the standard but is driven by the deep understanding of the customer context. Third party certification follows an evaluation of the quality system against specified context-neutral audit criteria. The outcome of successful evaluation is award of a certificate affirming that the management system

conforms to the standard as prescribed. Such an outcome has been considered a measure of the effectiveness of the management system in meeting the requirements of the customer and those of statutory and regulatory authorities.

The realities of managing organizations are that effectiveness in meeting customer requirements is a pre-requisite to achievement of the economic gains for the shareholders and the employees. Previous research on ISO 9001 quality management system standard in diverse geographical contexts have returned inconsistent findings. While some studies have returned findings suggesting a relationship exists between ISO 9001 certification and better quality and economic gain [7, 9, 23], other studies have found that no such relationships exist [5, 10, 21]. Some studies have gone as far as concluding from their findings that ISO 9001 quality management system certification can actually reduce quality-related benefits and profitability [18].

In this study, the focus was on ISO 9001:2008 standard as used for third party certification and the value of evaluation outcome as an indicator of effectiveness of the management system of an organization. The aim of the study was to examine the extent third party audit outcome can be taken as a pointer to the effectiveness of an organization in terms of its ability to achieve the satisfaction of the requirements of the customer. It sought to answer the questions: is there a relationship between a successful pre-certification audit and effectiveness of the quality management system in terms of satisfaction of customer requirements? What does pre-certification audit imply in terms of the concepts and principles underpinning the ISO 9001:2008 Quality Management System framework?

To get answers to these research questions, the study investigated the practices, the structure and the underpinning concepts and principles of ISO 9001:2008 quality management system in operating context. The objectives were to determine the extent pre-certification audit, as practiced in the operating context, can be an indicator of the level of application of the underpinning concepts and the level at which the underpinning principles influence decision-making. Another objective was to determine the relationship between pre-certification audit outcome and customer satisfaction.



## RESEARCH CONSTRUCTS

The foundational basis upon which a management system is built ought to provide it with integration frameworks for exchange of materials to and from its environment so as to achieve the required adaptation. In the case of ISO 9000 family of Quality Management System standards, this foundational basis is made up of a Business Process concept, and the eight underpinning self-reinforcing fundamental principles. These principles are customer focus, leadership, people participation, systems approach, process approach, fact-based decision making, improvement, and mutually beneficial supplier relationship [11, 13]. It is argued that principles direct what is done by a social group. By changing the principles behind decisions, things people habitually do in the social group change.

The change could be in form, focus, frequency, or in the “what”. The practices emphasized in an organization are dictated by the underlying principles that have been adopted in the organization. In the context of a management system standard, these practices are often referred to as implementation factors, implementation constructs or simply practices [23]. Quality management system is defined in ISO 9001:2008(E) in terms of two of these implementation factors: quality policy and quality objectives.

Quality policy is prescribed in the standard document as an instrument for embodying management commitment. It is considered as the embodiment of the fundamental principle of leadership [22]. It is argued that the fundamental principle of leadership ought to bring about the appropriate organizational culture and direction. The appropriate organizational culture is one in which it is accepted by all that satisfying customer requirements is the way if the organization’s members are to satisfy their personal needs, emphasizes customer-supplier chain, and in which all the members are empowered. These socio-behavioral outcomes of the quality policy are only achieved if the policy formulated is one that is capable of materializing into them [14]. The guideline standard describes an appropriate quality policy statement as one that conveys to the employees the desired degree of customer satisfaction, the type of future improvement needed, how the organization intends to develop them, and specifies the suppliers’ contribution.

The practice of establishing quality objectives as the starting point in a quality management system is based on the principle of process approach and constitutes the first phase of a Business Process model - Plan-Do-Check-Act cycle concept [13]. The framework prescribes four phases in process management, starting with determination of requirements and the processes for achieving these requirements. Quality objectives as the starting point in the Plan phase shapes the activities that are carried out in the organization. But the activities can only contribute to meeting the needs of interested parties if the objectives that shape them are relevant to these needs. If the quality objectives do not emphasize customer needs, if they do not focus on the process of achieving these needs, and do not include requirement for analysis and identification of improvement opportunities, their existence have no value beyond the ritual.

Process management as a practice responds to consistency and uniformity needs. ISO 9001:2008 quality management system standard requirement in clause 4.2.3 for control of documents not only provides for this but also provides a means for the check phase of the PDCA cycle. The value and usefulness of document control would be limited unless the information contained in records of work is analyzed to help prevent problems, to plan performance improvement, and in review of how the work has been performed. The fundamental principle of fact-based decision-making is also embodied in the practices that would be made possible by availability of these records. The “check” phase of the Business Process model is brought about in the standard by the requirement in management review clause 5.6. For the management review to have value and usefulness, the information from the review must be applied based on the framework that prescribes its use – the Business Process Model.

It is unlikely that a management review that does not include, as input, feedback from customers, information from performance records, and changes in process would meet the check phase requirement of the Business Process Model. The guideline standard, ISO 9004:2000, sets out the expectations and purpose that include feedback from customers, results of quality system audits, information from performance records, changes in any process, and changes from external

environment. But this would be taking place in a context in which all the parts that make up the system ought to cooperate and remained aligned to the goals of an organization. This presents an organization as a system view.

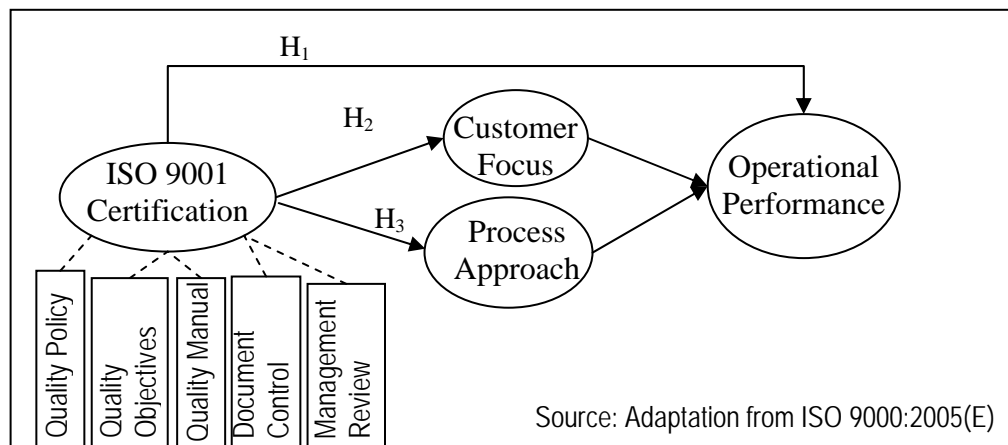
To embody the fundamental principle of systems approach, ISO 9001:2008(E) quality management system standard prescribes the development of the quality manual. The quality manual serves as the vehicle for superimposing the ISO 9001:2008 quality management system standard’s requirements upon the overall operational structure of an organization and how it functions. ISO 9004:2000(E), a guidance standard, specifies attitudinal indicators of quality manual’s suitability to play its role as the extent it is seen to promote “organization as a system” attitude, it is made available at the point of work, it describes the interactions between the different procedures in the

organization, and clarifies the aims of the organizational system.

**Theoretical Context and Hypotheses**

It would be expected that variations in actions connected with implementation of ISO 9001:2008-based management system will cause variations in the organizational system behavioral outcomes. These constitute the behavioral inputs as described by Armstrong [1]. The management system standard document identifies customer focus orientation and process approach as the behavioral outcomes to be achieved [15]. Success in pre-certification audit can therefore be considered as a significant measure of the extent an internal environment has been created that promotes these organizational system behavioral outcomes. The thinking is modeled as in Figure 1 below.

Figure 1: ISO 9001- Operational performance model



To test this model, the following hypotheses were proposed:

- H<sub>1</sub> Success in ISO 9001 certification audit indicates ability to achieve greater operational performance
- H<sub>2</sub> Success in ISO 9001 certification audit indicates greater customer focus has been achieved
- H<sub>3</sub> Success in ISO 9001 certification audit indicates greater process approach orientation has been achieved

**METHOD**

The need to be able to generalize the findings, made a compelling case for a cross-sectional, statistical study. The issues involved concerned organizational practices, their outcomes in terms of organizational system behavioral outcomes and operational performance, and the extent these change when ISO 9001 quality management system standard prescribed methodologies are put in practice. A major difficulty in a study such as



this is finding a common performance measure that an adequate number of the participating organizations have deemed strategically important, and which can be used for comparison. This is because the measures that are important may potentially dictate the aspects of management methodologies that are emphasized in the different organizations, hence introducing variation in a given performance dimension [17, 27].

The institutionalization of the performance contracting system for agencies of Kenya government provided the best context in which measures that are, to some extent, strategically closely related, and, at the same time, coming with reasonable numbers that can meet requirements for such a study, could be obtained. These organizations, having been put through a regime of annual performance evaluations, also had ready secondary data for some of the measures. Accordingly, participation in the annual performance evaluation as part of performance contracting system was the overarching criterion for inclusion in the population for the study. This restriction meant that only Kenya government agencies that have taken part in the annual performance evaluation qualified for inclusion in the population, with the number being, according to a report published in 2007 [8], 336. This number included 175 local authorities that had participated in the evaluation exercise only once and 37 parent ministries.

Another issue considered was the potential extraneous factors associated with the late program entry and possible difference that would be expected between the performance regimes that apply in the ministries and in the state owned service delivery enterprises. The latter tend to operate along the lines of commercial enterprises. To avoid these potential extraneous factors, local authorities and the line ministries were excluded from the population, leaving 124 public service agencies as the population for the study. These organizations ranged in size from 47 to 7213 employees with a median size 726.

The status of the different management practices and the organizational systems orientations was obtained from informants drawn from the staff of the organizations. In deciding on how to select these informants, consideration was given to the fact that quality management, as a management approach, emphasizes

strategy deployment as opposed to strategy content [3]. On this basis, information on the issues to be examined was obtained from those at deployment/implementation levels rather than at corporate strategy and top management levels. These included lower/functional level managers and staff at the supervisory and professional cadres. Since this group would probably not have been the major influencers in key strategic decisions such as those to do with organizational change, obtaining information from them about how the change is felt on the ground was expected to reduce potential biases from self-praise.

### Research Sample and Data Collection

With the issues for examination being a mix of events, processes and some attitudinal aspects, multiple informants were needed for each organization. The accuracy of data handling, the time factor and cost is important in such circumstances. With information relating to each organization being from multiple informants, taking a sample provides a more reliable data gathering exercise, with adequate accuracy during the processing of the data. Greater speed of data collection from a selected sample of the population reduced the threats to reliability of results that could be expected from environmental changes.

With accuracy level,  $E$ , of 5 percent, 95 percent confidence level on a five-point Likert type measurement scale, and taking one sixth of the range in the five-point scale as a close estimate of the standard deviation, a minimum sample size of 75 was computed using Zikmund formula,  $n=(Z^2S^2)/E^2$  [28]. Since the calculated sample size was greater than five percent of the population, a finite population correction factor,  $\sqrt{((N - n)/(N - 1))}$ , was applied to arrive at a sample size of 47.4. A sample of sixty organizations was drawn using systematic sampling method, with the names of organizations arranged in alphabetical order in the sampling-frame. Random sampling method was used to select 14 informants from the internal telephone directories in the selected organizations. Data was collected from these informants during a 30 day period starting from mid-March 2010. Where the directory was found unusable, a list was obtained from human resource departments for use as sampling frame.



ISO 9001 certification status information was available from records in the participating organizations. Also available from records was customer satisfaction survey score obtained for these organizations in the 2008/2009 Government of Kenya performance contracting period. Other information from the records of the participating organizations related to performance score in the 2007/2008 performance evaluation exercise. This and customer satisfaction score together constituted one form of operational performance data.

The 14 sampled members of the participating organizations were each given a structured questionnaire for completion to be collected later. The questionnaire provided perceptual data relating to the variables of ISO 9001 implementation factor levels, customer focus, process approach, and the operational performance measures of cost efficiency, timeliness and reputation. The item indicators used to operationalize the variables representing ISO 9001 implementation factors and the organizational system outcome variables of customer focus and process approach were obtained from the twin standard documents, ISO 9001:2008(E) and ISO 9004:2000(E), Dean and Bowen [3], and Deming [4]. The ISO 9001 implementation factors variables were operationalized by the extent the characteristics of the practices implemented conform to the concepts and principles the practices are meant to embody. Conformity of the characteristics of the implemented practice to the underlying principle was an indication of the extent to which the particular practice is the principle's embodiment and provided a measure of the implementation level. The absence of such conformity would be an indicator that the implementation is iconic, ritualistic and superficial [2, 11].

The organizational system outcome variables of customer focus and process approach were measured by the existence of the expected behavioral outcomes that are consistent with organizations that emphasize customer-value and process approach in management of value creating activities, respectively. Customer focus was measured by identifying the existence of systems to identify the customer to every activity, the needs of the identified customers and the processes which are used to create value that is passed to the identified customer. Other indicators were systems and processes for translating customer needs to products, regularly measuring customer satisfaction, evaluating activities to

determine their contribution to meeting customer requirements, listening to and learning from customers, and defining key customer groups. The extent process and system factors were emphasized as opposed to social factors in task performance goal achievement, the importance attached to stability and capability of processes, the way everyone in the organization works, and the extent reduction of complexity is emphasized were used to measure process approach.

The variable of performance was operationalized using single items to represent each dimension of performance. The dimensions were as specified in the government of Kenya performance contracting operations criteria [8]. These are cost efficiency, timeliness, quality of service, relevance, satisfied customers, and reputation. Because ISO 9001:2008 standard focuses narrowly to customer and regulatory requirements, the focus was on the customer-focused performance dimensions of reputation and relevance as perceived by the staff of the organization. The 5 point measurement scale was based on self-reported performance perception against a benchmark, with the scale relating to an informant's subjective perception of their organization's performance, in a given dimensions, relative to a benchmark. Tangen [24] and Richard et al. [21] suggest that perceptual measures can effectively be used in place of objective data on account that correlation with objective data values have been proved in tests and the fact that obtaining accurate objective data is often difficult.

Approximately 70 percent of the questionnaires issued were returned completed from 47 of the sixty organizations contacted. Between 12 and 14 questionnaires were returned completed from one third of the organizations that agreed to participate. The lowest number of completed questionnaires from a participating organization was 6. Analysis indicated that the non-responders were from across the organizational hierarchy and no particular group dominated. Further analysis indicated that a correlation between the number of responses from a participating organization and the means for the ISO 9001 implementation factors was - 0.050 and was insignificant with a p-value of 0.739. This provided a confirmation that the number of questionnaires returned from each participating organization had no significant influence on the mean score for that organization in the key multi-item variable.



To test for the scale reliability of perceptual data collection instrument, scale alpha (scale  $\infty$ ) statistics were computed for the multi-item datasets used in the measurement of the variables representing ISO 9001:2008 implementation factors and the organizational system behavioural outcome variables of customer focus and process approach. Item-Total Correlations for the items used to measure each of the multi-item variable constructs were also computed to provide a measure of instrument validity. With computed scale alpha (scale  $\infty$ ) values that were greater than 0.74 and Item-Total Correlation coefficients greater than 0.50 in all multi-item constructs except in the cases of two ISO 9001 implementation factor variables, internal consistency of the instrument was statistically confirmed. The two construct variables that had items with Item-Total Correlation coefficients below 0.50 retained because deletion would reduce scale alpha statistics were Document Control and Management Review. In all, only three items were retained with Item-Total Correlation coefficients of 0.4879 and 0.4992 for document control construct and 0.4624 for management review construct.

Normality test statistics computed in both Kolmogorov-Smirnov (KS) and Shapiro-Wilk tests for the data relating to the operational performance variables were significant at p-value <0.05 for the 2007/2008 performance contracting evaluation score, timeliness, and service quality in at least one test. Parametric tests that are based on assumptions of normality were therefore only applied to customer satisfaction survey score and overall perceived performance variable aspects

of operational performance. These two performance variables passed the test of normality based on both tests as well as on evaluation of the Skew statistics that were within +1 and -1. Levene statistics computed for each of the variables of overall perceived performance, customer satisfaction survey score, and the organizational system behavioral outcome variables of customer focus and process approach were all insignificant at p-value of 0.05. The assumptions that the variances of the means of performance measures of customer satisfaction score and overall perceived performance together with its dimensions within groups based on ISO 9001 certification status are equal was therefore also confirmed. Similarly, the assumptions of homogeneity of variances within groups based on certification status for the variables of customer focus and process approach were also confirmed by the data.

**FINDINGS AND ANALYSIS**

Table 1 presents performance data, categorized into high performers and low performers by ISO 9001 certification status. For each of the performance measures, cases with variable values up to 50th percentile were categorized as “low performers” while cases above the 50th percentile were categorized as “high performers”. The table shows that, based on both measures of performance, organizations in the high performers group appear much lower than the expected chance number for non-ISO 9001 certified group, while the reverse is true for the ISO 9001 certified group.

Table 1: Categorized performance scores by ISO 9001 certification status

Performance category	Frequency	Customer Satisfaction Score (from independent customer survey score)			Composite perceived performance (reputation and relevance)		
		Not Certified	ISO 9001 certified	Total	Not Certified	ISO 9001 certified	Total
Low performers	Count	10	13	23	13	10	23
	Expected	7.0	16.0	23.0	7	16	23.0
High performers	Count	4	19	23	1	23	24
	Expected	7.0	16.0	23.0	7	17	24.0
Total	Count	14	32	46	14	33	47
	Expected	14.0	32.0	46.0	14.0	33.0	47.0

A Pearson correlation matrix for the means of the variables representing the ISO 9001 implementation factors and the organizational systems outcomes

intended to bring about improved performance and hence indicators of effectiveness are presented in Table 2. The statistics show four of the five ISO 9001



implementation factor variables, namely, quality policy, quality objectives, quality manual, and document control, as highly correlated, while the fifth implementation factor variable, management review, is shown as correlating more strongly with customer focus

and process approach. The statistics also show significant but relatively weaker correlations between management review and the other four ISO 9001 implementation factor variables.

Table 2: Pearson correlation matrix for implementation and behavioural outcome variables

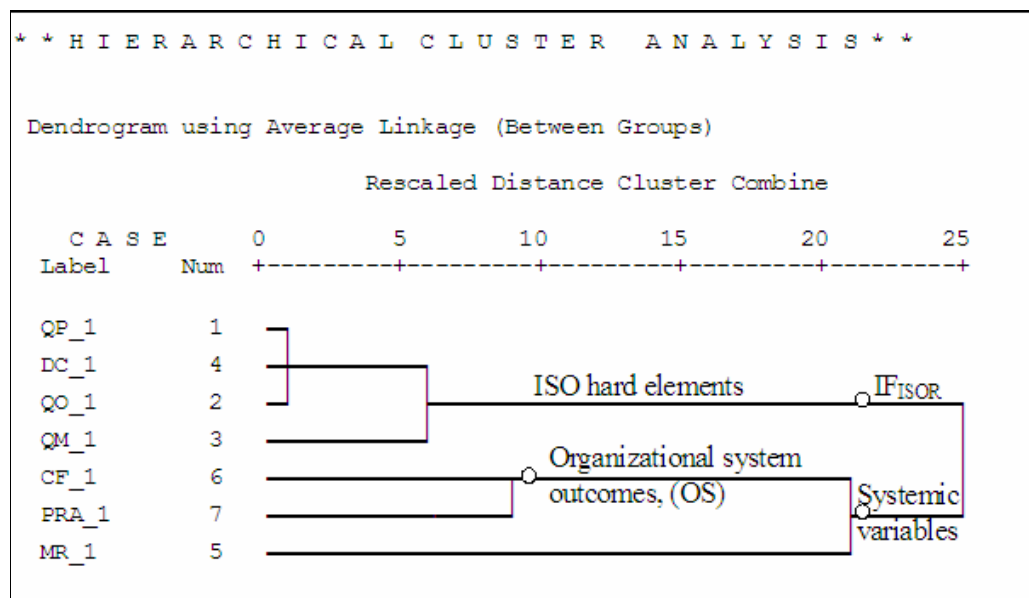
	QP	QO	QM	DC	MR	CF
Quality objectives (QO)	<b>0.993*</b>					
Quality manual (QM)	0.982*	0.985*				
Document control (DC)	0.972*	0.970*	0.962*			
Management review (MR)	0.602*	0.592*	0.565*	0.697*		
Customer focus (CF)	0.552*	0.544*	0.480*	0.683*	<b>0.838*</b>	
Process approach (PRA)	<b>0.393*</b>	<b>0.380*</b>	<b>0.319*</b>	0.528*	<b>0.782*</b>	<b>0.904*</b>

Note: \* - Significant at p-value of 0.05 – 2-tailed.

A classification, using hierarchical cluster analysis method, of the ISO 9001 certified organizations based on the implementation factors and the behavioral outcome variables is presented in Figure 2. The figure shows the defining characteristics of the smallest cluster as the emphasis of the organizations on the ISO 9001 implementation factor variables of quality policy (QP\_1), quality objectives (QO\_1) and document control (DC\_1). Organizations in this class form a distinctive group with other organizations that place significant

emphasis on a fourth implementation factor variable, the quality manual (QM\_1). The status of these variables as the most visible and distinctive facets of ISO 9001 standard certification can be discerned from the boxplots in Figure 3. The fifth implementation factor, the management review (MR\_1) is, however, shown to be closer to the organizational system outcome variables of customer focus (CF\_1) and process approach (PRA\_1) with which it forms a natural configuration grouping.

Figure 2: Configurations of ISO 9001 certified organizations







The between group difference between the Management Review (MR\_1) and the other four implementation factors is illustrated in figure III in terms of the effect of certification status on variability, minimum and median values. The median and range values for the ISO 9001 certified organizations and the non-certified ones appear to be much closer than the data indicates for the other four implementation factors. Rather than the on/off effect the certification status has on the other implementation factors, management review (MR\_1) appears to exist, to some degree, in all organizations. Similar non-on/off characteristics are shown in the boxplots in Figure 4 for the organizational system outcome variables of customer focus (CF\_1) and process approach (PRA\_1). Like the management review, these organizational factor variables are also shown in the

boxplots without the on/off behaviour with certification status change. Instead, it is the directions of skew that is shown to change with certification status change. The boxplots in Figures 3 and 4 and the Hierarchical Cluster dendrogram in Figure 2 present two configurations of ISO 9001 certified organizations. One configuration is inclined towards greater emphasis to the more visible and distinctive static processes of ISO 9001 quality management system implementation while the other emphasize the systems factors. These are labelled in Figure 2 as ISO hard elements (IF<sub>ISOR</sub>) and Systemic variables, respectively. The impact of each of these on achievement of stakeholder requirements in terms of customer satisfaction and dimensions of perceived overall performance is indicated in the Partial Correlation Matrix in Table 3:

Figure 3: Box plots of ISO 9001 implementation factors levels by certification status

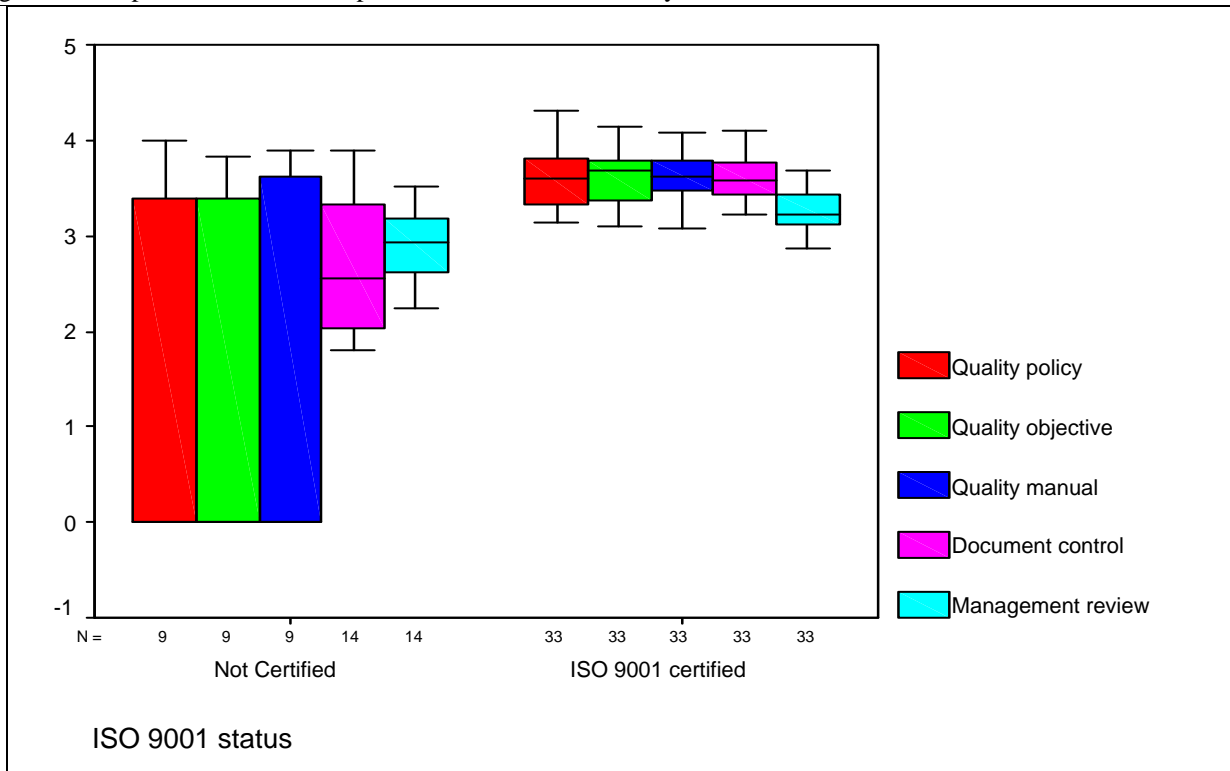
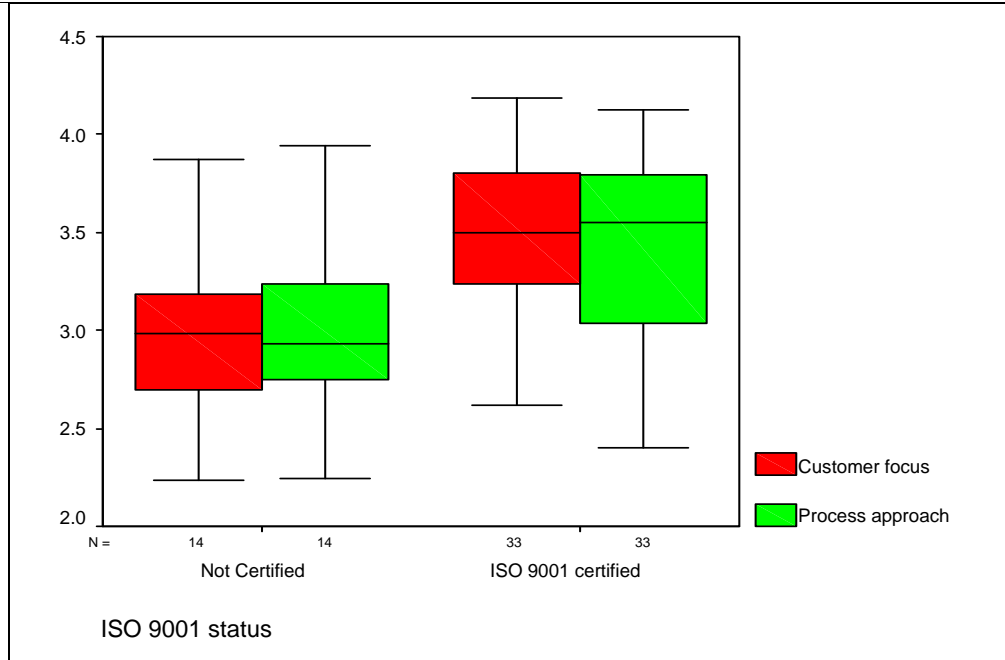




Figure 4: Boxplots of organizational system variables by ISO 9001 certification status



The Partial Correlation Matrix in Table 3 indicates that none of the customer-focused performance measures of operational performance is significantly correlated with the ISO hard elements ( $IF_{ISOR}$ ) when systemic variables are controlled for. In contrast, the correlations between systemic variables and the two customer-focused dimensions of perceived overall performance are all significant at  $p$ -value  $< 0.06$  even when the ISO hard elements variable is controlled for. In-fact, the coefficient representing the relationship between the

systemic variables and the customer satisfaction measure improves when ISO hard elements ( $IF_{ISOR}$ ) variable is controlled for. The data presented in this table, however, also shows ISO hard elements as a composite variable positively impacts the relationship between systemic variables and performance dimensions of reputation and relevance, suggesting one or more of the four implementation factors may be positively interacting with the systemic variables.

Table 3: Partial Correlation Matrix for performance and input variables

Input factor variables	Customer satisfaction score	Dimensions of perceived overall performance		Remarks
		Reputation	Relevance	
ISO hard elements ( $IF_{ISOR}$ )	0.1633 <sup>2</sup>	0.5140*	0.3023 <sup>2</sup>	Zero Order correlations
	-0.1724 <sup>2</sup>	0.1887 <sup>2</sup>	-0.0150 <sup>2</sup>	Systemic factors controlled for
Systemic factors	0.3791*	0.5625*	0.4028*	Zero Order correlations
	0.3826*	0.3224**	0.3756**	$IF_{ISOR}$ controlled for

Note: \*. Significant at  $p$ -value  $< 0.005$   
 \*\*. Significant at  $p$ -value = 0.059

2. Not significant at  $p$ -value = 0.10



**DISCUSSIONS AND INTERPRETATION**

This study adds to the ISO 9001 certification – operational performance literature by investigating the key assumptions in third party certification as the key focus for implementation of ISO 9001 quality management system. It distinguishes use of the standard for first party and second party applications from the certification-driven third party application. The issue for determination was whether positive pre-certification audit can indicate the likelihood of an organization being a higher performer in its industry. Another issue for determination was how the systemic variables that comprise one of the five ISO 9001 implementation factors and the input behavioral outcomes of customer focus and process approach are enhanced in the organizations and how the audit practice assess these outcomes.

The data presented in Table 1 suggests that, based on both performance measures, the ISO 9001 certified organizations in the high performers group are more than would be expected from chance. The significance of this frequency distribution was determined by successively testing Hypothesis H<sub>1</sub> that there is a direct relationship between ISO 9001:2000 certification status and operational performance, using the different performance measures. Table 4 presents computed Pearson Chi-Square, continuity correction, and Fisher's Exact Test statistics for the customer satisfaction score and a composite perceived overall performance data.

As some of the cells have expected frequencies of only 7, the continuity correction statistic and Fisher's exact test provide better indicators of association than the Pearson Chi-Square. Both continuity correction and Fisher's Exact Test statistics were not significant at a p-value greater than 0.10 in the case of customer satisfaction survey score but were significant at p-value less than 0.05 for the perceived performance data.

On the basis of the computed Chi-Square statistics the null hypothesis that being classified into low performer or high performer category is independent of an organization's ISO 9001 certification status was accepted for customer satisfaction performance measure and rejected in the case of perceived operational performance as a composite of reputation and relevance. It can be concluded that, in terms of customer satisfaction, ISO 9001 certification is probably not going to significantly influence the probability of an organization being a high performer relative to the non-certified ones. However, in terms of how the employees in the organization perceive their performance, an ISO 9001 certified organization is more likely to be perceived by its employees as a high performer relative to the non-certified ones.

These findings appear to reveal some inconsistencies as well. A situation in which reputation is influenced by a certification status yet the same is not true with customer satisfaction. A situation of perception gap?

Table 4: Chi-Square Tests for performance data by ISO 9001 certification status

Performance data	Statistic	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Customer satisfaction survey score	Pearson Chi-Square	3.696	1	0.055	
	Continuity Correction <sup>a</sup>	2.567	1	0.109	
	Fisher's Exact Test				0.108
	N of Valid Cases	46			
Perceived performance (reputation and relevance of products)	Pearson Chi-Square	15.393	1	0.000	
	Continuity Correction <sup>a</sup>	12.991	1	0.000	
	Fisher's Exact Test				0.000
	N of Valid Cases	47			

Note: Note: (a) The minimum expected count is 7.



The fact that data for the two performance measures have different origin could suggest another interpretation of the link between ISO 9001 certification and performance. The data for customer satisfaction was collected by an independent customer feedback survey firm from stakeholders while the overall performance measures reflect what the staff of the participating organizations perceived about the performance of their organization. A partial correlation matrix in Table 5 reveals the gap between the perceptions in the organizations and those of the customers.

The statistics in the table show that even though customer satisfaction score and the ISO 9001 certification status had strong correlation, the correlation between the two performance measures with different data sources was in fact not significant when ISO 9001

certification status is controlled for. It would appear that there was a gap between what the customers perceived and what the staff of the participating organization thought. The much stronger correlation between the staff perception of performance and the ISO 9001 certification status of the organization could suggest that the iconic value of the certification could be inward and making staff feel they are better in relative terms. The weak and insignificant correlation between the two measures with ISO 9001 status controlled for would appear to indicate the gap between the expectations of the customer and the perception of these expectations within ISO 9001 certified organizations are probably maintained. This gap is a key factor in quality shortfall in service delivery as described by Parasuramn, Zeithaml and Berry [19].

Table 5: Partial Correlation Matrix for different performance measurement data sources

		Overall perceived performance (Perf <sub>t</sub> )	ISO 9001 status
Customer Satisfaction score (CSSurv)	Zero order	0.422	.532
	ISO 9001 status controlled for	0.056 <sup>ns</sup>	
Overall perceived performance (Perf <sub>t</sub> )	Zero order		0.74

Notes: ns - Not significant at p = 0.05

The aims of ISO 9001:2008 standard as stated in the publication is to “enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and assurance of conformity to customer and applicable regulatory requirements” [15- p. 1]. The findings suggest there is a gap between perceptions within the organizations and those of the customers. Findings also suggest the relationship between customer satisfaction and ISO 9001 certification is not significant. Could this inconsistency be a result of shortcomings in audit practices?

The prescribed ISO 9001 implementation factors are meant to bring about organizational system outcomes that would be expected to enhance performance. It is established in Figure II that the first four implementation factors of quality policy, quality objectives and document control do not appear to form a common natural grouping with the fifth one - management review, nor with the organizational system behavioural outcomes of customer focus and process approach. It

would therefore be expected that any association between ISO 9001 certification status and the levels of these organizational system outcomes would only be through the fifth factor that forms common classification grouping with the latter. To confirm or disconfirm this position, a multiple regression analysis, using Stepwise method, with the variables for the five implementation factors entered and removed based on the criteria of Probability-of-F-to-enter at  $\leq .050$  and Probability-of-F-to-remove at  $\geq .100$  was applied to the data.

Based on statistics computed from cases with no missing values for any variable, the variables for quality policy, quality objectives, quality manual and document control are excluded from the regression with t significant p-values greater than 0.05 and Beta In of 0.125, 0.122, 0.054 and 0.204, respectively. The regression model estimated accounts for 64 percent of the variation in customer focus, and has F. significance p-value  $<0.001$ . The significant model generated by the Stepwise regression method has  $F_{1,40} = 64.254$  and  $p < 0.001$ . As shown in Table 6 below, the model has constant and



management review as the only predictors with the Adjusted R Square ( $R^2$ ) of 0.607.

Table 6: Customer focus model coefficients

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tol.	VIF
(Constant)	-0.362	0.472		-0.768	0.447		
Management review	1.171	0.146	0.785	8.02	0.000	1.00	1.00

In view of the computed t-statistics for the variables of quality policy, quality objectives, quality manual and document control of 1.017, 1.007, 0.447 and 1.586, respectively, all of which have p-values > 0.1, the hypothesis that not all the coefficients for the variables that make up ISO 9001 implementation factors are significantly different from zero in a regression of customer focus is accepted. It is therefore concluded that the implementation factors of quality policy, quality objectives, quality manual and document control are not associated with the organizational system outcome of customer focus. The interpretation has to be that successful pre-certification audit does not necessarily indicate systems are in place for enhancement of customer focus.

Similarly, in a regression with process approach as dependent variable using Stepwise method, only management review variable is left in the regression, based on the criteria of Probability-of-F-to-enter at  $\leq 0.050$  and Probability-of-F-to-remove at  $\geq 0.100$ . With the computed t-statistics for the excluded variables of quality policy, quality objectives, quality manual and document control of -0.695, -0.762, -1.216, and -0.501, respectively, all of which have p-values > 0.1, the hypothesis that not all the coefficients for the variables that make up ISO 9001 implementation factors are

significantly different from zero in a regression of process approach is accepted. The significant regression model estimated accounts for 52 percent of the variance in process approach and has F- significance p-value < 0.001 with an  $F_{1,40} = 51.45$ . Like the customer focus model, the process approach model has constant and management review as predictors. It has Adjusted R Square ( $R^2$ ) of 0.552 with the coefficients for the predictors of variance in process approach as shown in Table 7.

These finding lead to a conclusion that, of the implementation factors of quality policy, quality objectives, quality manual, document control and management review, only management review factor is significantly associated with the organizational system outcome of process approach. On the basis of the statistics, the hypothesis that success in ISO 9001 certification audit indicates greater process approach orientation cannot be accepted to an extent beyond an effective audit of management review clause. The interpretation has to be that successful pre-certification audit does not necessarily indicate systems are in place for enhancement of process approach unless the audit practice resulted in effective evaluation of management review procedures and practices.

Table 7: Process approach model coefficients

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	S.E	Beta			Tol.	VIF
(Constant)	-1.325	.656		-2.019	.050		
Management review	1.458	.203	.750	7.173	.000	1.00	1.00



## CONCLUSIONS AND IMPLICATIONS

The models for customer focus and process approach suggest that the objective of creation of customer focus and process approach orientation in an organization cannot be achieved if emphasis is placed on the visible and hard elements of certification. However, one conclusion drawn from the findings are that the effect of the practices prescribed in ISO 9001 management system standard on the customer-focused performance measures is through the behavioral input outcomes of customer focus and process approach. The fact that that a successful audit leading to certification can still be achieved where an organization focuses only on the prescribed iconic practices of quality policy, quality objectives, quality manual and document control has been confirmed. An implication from these findings is that two ISO 9001 certified organizations are not necessarily the same in terms of the drivers of customer-focused performance. The nature and method of conducting the audit itself would be the critical factor in the certification status as an indicator of effectiveness in achieving customer-focused performance objectives.

An alternative interpretation is that, while audit may provide an effective evaluation of conformance to specifications, the concepts and principles at play in a management system are such that evaluation of effectiveness would, perhaps, require competences different from those of many systems auditors. ISO19011:2011(E) [12] recognizes this fact when it specifies sources of knowledge required that include experience in a relevant technical, managerial or professional position involving the exercise of judgment, decision making, problem solving and communication

with managers, professionals, peers, customers and other interested parties. In third party audits, knowledge of audit principles, procedures and methods, management system standards and reference documents, and applicable legal and statutory requirements has been the basis for qualifying to audit. An auditor equipped only with this narrow knowledge would probably be able to use the generic audit and management system standards knowledge to assess for conformance to standard specification but would be ill-equipped to determine management system effectiveness. The findings of this study attests to this position.

## LIMITATIONS AND AREAS FOR FURTHER RESEARCH

As a statistical study, the research would be expected to be limited in depth. Other risks include response and extremity biases that cannot be completely eliminated when questions relating to socio-behavioral aspects of organizational life are put to the respondents and. To some extent these risks were minimized by use of multiple informants from each participating organization and careful wording of the questions in the instrument.

Another limitation concerns the sample. The participating organizations operate in desperately different sectors, differ in sizes and may be at very different levels in terms of organizational evolution. These differences can potentially lead to differences in the variables and hence results. Socio-behavioral issues are also sensitive to cultural factors. Understanding the role the organizational and national cultures play in influencing these implementation factors would make interesting contribution to the body of knowledge.

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